

Robinieae (8.01–8.12)

Genus: *Sesbania* G.A. Scopoli

Phylogenetic Number: 8.01.

Tribe: Robinieae.

Group: *Sesbania*.

Species Studied—Species in Genus: 37 spp.—ca. 50 spp.

Fruit a legume; unilocular; $2\text{--}30 \times 0.2\text{--}1.5 \times 0.2\text{--}0.8$ cm; with deciduous corolla; with deciduous calyx; without orifice formed by curving of fruit or fruit segments; straight or curved (or slightly curved); not plicate; not twisted or twisted; symmetrical; linear or oblong; not inflated; terete or compressed; with or without beak; straight; with solid beak the same color and texture as fruit; tapered or short tapered at apex; apex aligned with longitudinal axis of fruit; truncate or short tapered at base; base aligned (slightly) or oblique with longitudinal axis of fruit; with the apex and base uniform in texture; ligneous or coriaceous (with thickened sutures); seed chambers externally visible; with the raised seed chambers torulose. Fruit margin not constricted or slightly constricted or constricted along both margins; without sulcus; plain or embellished; with wings. Fruit wings absent or present; 4; up to 10 mm wide; continuous wing around fruit; on both valves. Fruit stipitate or nonstipitate; with the stipe up to 15 mm long. Fruit with all layers dehiscing (to subdehiscent); splitting along sutures. Dehiscence of valves along both sutures; medial and up and down or apical and down; passive. Replum invisible. Epicarp dull; monochrome or multicolored; mottled; brown (to reddish) or tan; with red overlay; glabrous; eglandular or glandular; with glandular dots; without spines; not smooth; with elevated features; reticulately veined; not tuberculate; wrinkled; not exfoliating, exfoliating in part, or exfoliating; without cracks. Mesocarp thick or trace; surface not veined; 1-layered; without balsamic vesicles; without fibers; solid or vitreous (individual “pellets”); coriaceous or ligneous (sub). Endocarp glossy; monochrome; tan (pale); smooth; septate; with septa thicker than paper, firm and with septa thin (tissue paper-like), flexible or with septa thin (tissue paper-like), flexible; with the septa eglandular; coriaceous; not exfoliating; remaining fused to epicarp; entire. Seeds 5–40; length parallel with fruit length; neither overlapping nor touching; in 1 series. Funiculus less than 0.5 mm long (virtually no length); of 1 length

only; flattened; straight. Aril absent or present; dry. Aril rim-aril. Aril brown or white.

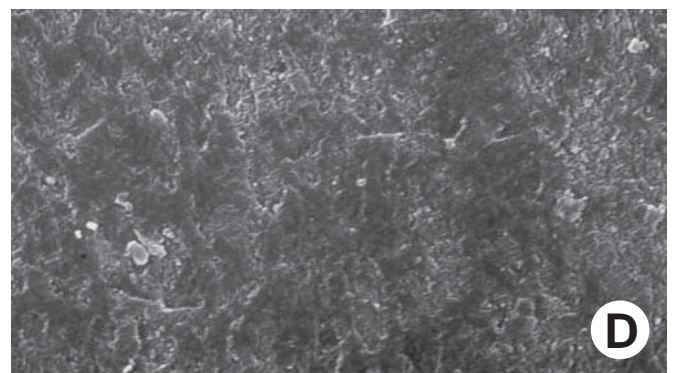
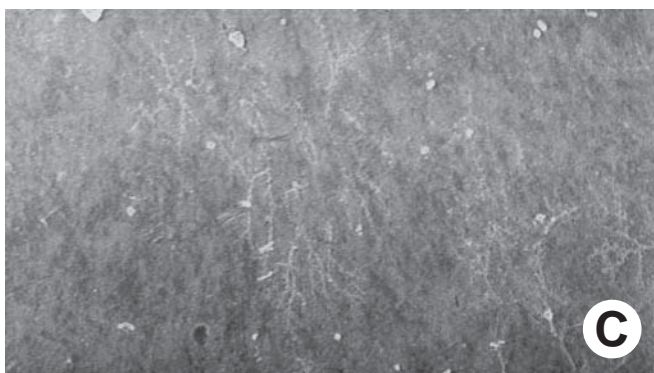
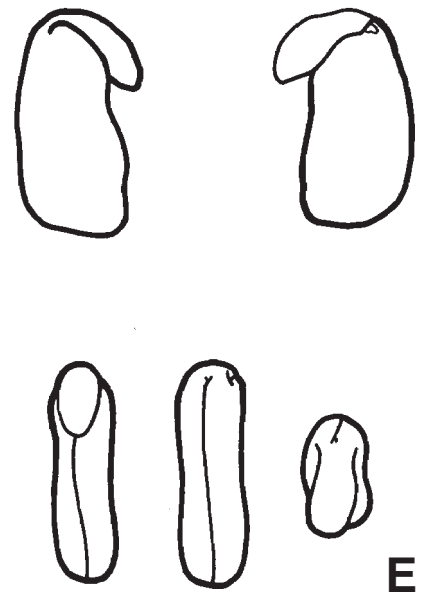
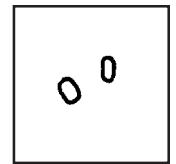
Seed $3\text{--}7 \times 1.5\text{--}5 \times 1.5\text{--}5$ mm; not overgrown; not angular; asymmetrical; oblong, rectangular, quadrangular, or mitaform; terete or compressed; with surface smooth; without visible radicle and cotyledon lobes; without hilar sinus; without umbo on seed faces. Testa not adhering to or partially adhering to endocarp (thin scurfy layer); glossy or dull; not modified by a bloom; colored; monochrome or mottled and streaked; with frequent mottles; with frequent streaks; brown (to reddish or greenish), tan, green, olive, blue (gray), gray (blue), or orange; with brown (reddish), purple, or black overlay; glabrous; smooth; coriaceous. Fracture lines absent or present; reticulate. Rim absent. Wings absent. Raphe not visible or visible (what appears to be a raphe is scored as the lens); from lens to base of seed and bifurcating; not bifurcating; darker than testa; brown (reddish); flush. Hilum visible or fully concealed (nearly); concealed by aril (rim); with faboid split; with the lips of the faboid split the same color as or lighter colored than the rest of the hilum and therefore conspicuous; punctiform or larger than punctiform; 0.3–1.5 mm long; with curved outline; circular; marginal according to radicle tip; flush (slightly); within rim and not within corona or halo. Hilum rim color lighter or darker (slightly) than testa. Lens discernible; less than 0.5 mm or equal to or greater than 0.5 mm in length; 0.5–1.2 mm long; with margins straight or curved; linear (more or less within darker circle); circular (more or less with central line or groove) or elliptic; not in groove of raphe; confluent with hilum or adjacent to hilum; up to 1.5 mm from hilum; mounded (slightly to well developed); similar color as testa; darker than testa; brown (reddish) or black; not within corona, halo, or rim. Endosperm thick; covering entire embryo; thick layer adnate to embryo and adnate to testa (thin layer). Cotyledons smooth; both outer faces convex; both the same thickness; both more or less of equal length; not folded; margin entire 180 degrees from base of radicle; similar at apex; not concealing radicle; split over radicle; with lobes; without basal groin formed by lobes; with the interface division terminating at base of radicle; without margins recessed; tan, yellow (pale), or white; inner face flat; glabrous around base of radicle. Embryonic axis deflexed; oblique to length of seed; without a joint evident between the radicle and the cotyledons. Radicle bulbous; deflexed and parallel to cotyledon length or deflexed and parallel to cotyledon width; centered between cotyledons; less than 1/2

length of cotyledons. Plumule rudimentary or moderately developed; glabrous.

Distribution: Pansubtropical and pantropical.

Notes: The genera, generic groups, and related data follow the tribal treatment of Lavin and Sousa (1995) and Polhill (1994a,b), and not Polhill and Sousa (1981). Gillett (1963c) monographed *Sesbania* species in Africa (excluding Madagascar) and southern Arabia, and Sachet (1987) studied the littoral species of *Sesbania* in the South Pacific. We agree with Siwundla and Stucky (1989) that *Glottidium* (8.01A) is a separate genus and that *Daubentonia* should be maintained within *Sesbania*. This finding confirms the 10 differences between *Sesbania* and *Glottidium* of Gillett. We agree with Lavin (1987) that “the diversity of the legumes and seeds of *Sesbania* is unrivalled among related genera.” Lavin and Sousa (1995) erected an infrageneric classification for *Sesbania* that included *Glottidium* as a section (see notes for *Glottidium*). Manning and Staden (1987a) discussed the role of the lens in seed imbibition.

Sesbania: *S. emerus* (J.B.C.F. Aublet) I. Urban (*C–E*), *S.*
spp. (*A–B*). *A*, Fruits ($\times 3.8$); *B*, seeds ($\times 4.4$); *C–D*,
testa ($\times 50$, $\times 1000$); *E*, embryos ($\times 7$).



Genus: *Glottidium* A.N. Desvaux

Phylogenetic Number: 8.01A.

Tribe: Robinieae.

Group: Sesbania.

Species Studied—Species in Genus: 1 sp.—1 sp.

Fruit a legume; unilocular; $7\text{--}7.5 \times 1\text{--}1.8 \times 0.4\text{--}0.9$ cm; with deciduous corolla; with deciduous calyx; without orifice formed by curving of fruit or fruit segments; straight or curved (slightly); not plicate; not twisted; asymmetrical or symmetrical; elliptic or oblong; with both sutures parallelly curved; not inflated; compressed; with beak; straight; with solid beak the same color and texture as fruit; tapered at apex; apex aligned with longitudinal axis of fruit; long tapered at base; base aligned or oblique with longitudinal axis of fruit; with the apex and base uniform in texture; membranous; seed chambers externally visible. Fruit margin not constricted or constricted along both margins; without sulcus; plain. Fruit wings absent (on epicarp, but endocarp winged). Fruit stipitate; with the stipe 15 mm long. Fruit with epicarp and mesocarp dehiscent and endocarp not dehiscent; with epicarp and mesocarp splitting along suture, endocarp entire forming an envelope around the seeds with flat winglike parts. Dehiscence of valves along both sutures; apical and down; passive. Replum invisible. Epicarp dull; monochrome; brown (to reddish brown); glabrous; eglandular; not smooth; with elevated features; reticulately veined; not tuberculate; warty (somewhat and tiny); not exfoliating; without cracks. Mesocarp thin (inner surface with reddish-brown reticulum); surface not veined; 1-layered (thicker near sutures); without balsamic vesicles; without fibers; solid; chartaceous or coriaceous (near sutures). Endocarp dull; monochrome; tan; smooth; nonseptate; chartaceous; separating from epicarp (and 1- or 2-seeded winged indehiscent unit); entire. Seeds (1–)2; length parallel with fruit length; neither overlapping nor touching; in 1 series. Funiculus less than 0.5 mm long (but as broad as 5 mm hilum); of 1 length only; filiform; straight. Aril absent.

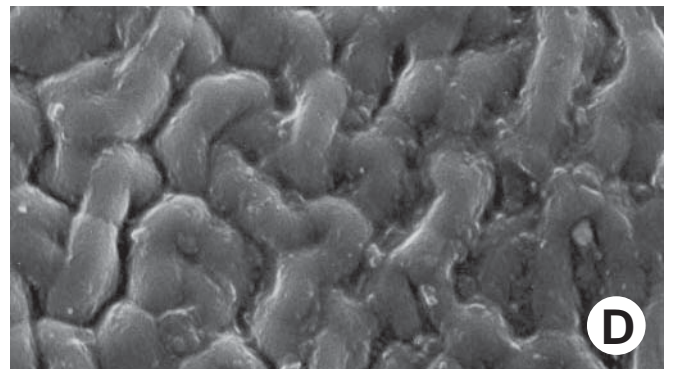
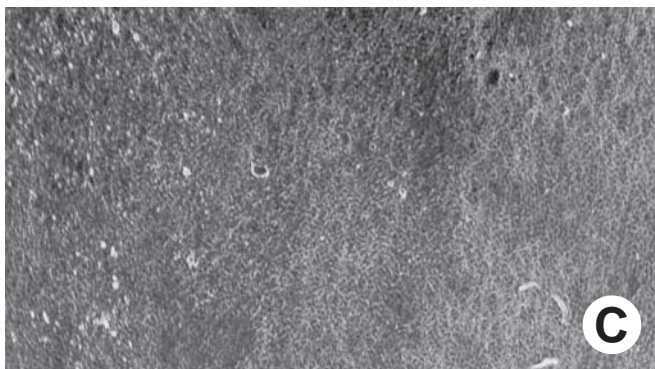
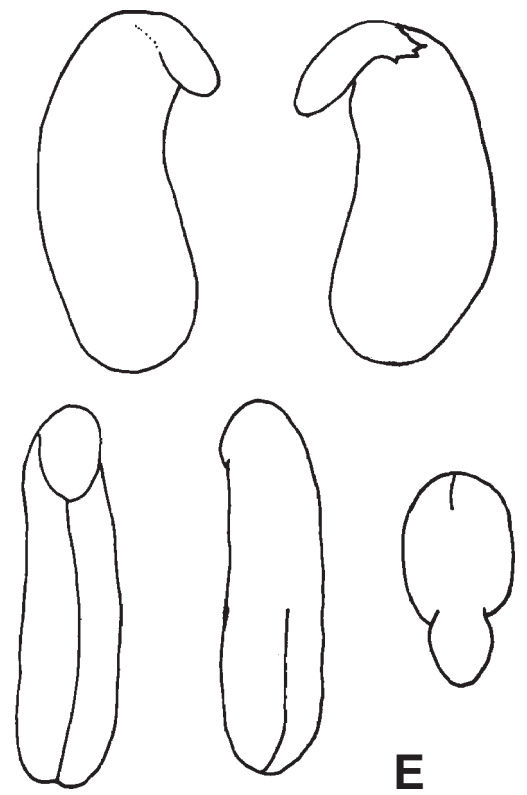
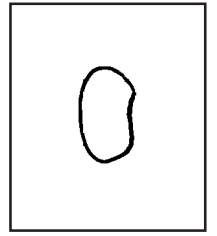
Seed $10\text{--}12 \times 4.5\text{--}6.5 \times 3.5\text{--}5$ mm; not overgrown; not angular; asymmetrical; oblong or reniform (barely); terete; with surface smooth; with visible radicle and cotyledon lobes; without external groove between radicle and cotyledon lobes; without hilar sinus; without umbo on seed faces. Testa not adhering to

endocarp or partially adhering to endocarp; dull; not modified by a bloom; colored; monochrome or bichrome (if tan endocarp tissue present); reddish brown; glabrous; smooth; osseous. Fracture lines absent. Rim absent. Wings absent. Raphe not visible. Hilum visible or partially concealed; concealed by funicular remnant; with faboid split; with the lips of the faboid split the same color as the rest of the hilum; larger than punctiform; 5 mm long; with straight outline; oblong; marginal according to radicle tip; recessed; within rim. Hilum rim color of testa. Lens discernible; equal to or greater than 0.5 mm in length; 2.5 mm long; with margins straight or curved; oblong (with linear center and often ending in circular area); not in groove of raphe; confluent with hilum; flush; similar color as testa; darker than testa; brown (reddish); not within corona, halo, or rim. Endosperm thin; covering entire embryo; adnate to embryo. Cotyledons smooth; both outer faces convex; both the same thickness; both more or less of equal length; not folded; margin entire 180 degrees from base of radicle; similar at apex; not concealing radicle; split over radicle; with lobes; with basal groin formed by lobes; with the interface division terminating at base of radicle; without margins recessed; yellow or tan; inner face flat; glabrous around base of radicle. Embryonic axis deflexed; oblique to length of seed; without a joint evident between the radicle and the cotyledons. Radicle bulbous; lobe tip straight; deflexed and parallel to cotyledon length; centered between cotyledons; less than 1/2 length of cotyledons. Plumule rudimentary; glabrous.

Distribution: Southeastern United States.

Notes: We agree with Siwundla and Stucky (1989) that *Glottidium* is a separate genus from *Sesbania* (8.01). This finding confirms the 10 differences between *Glottidium* and *Sesbania* of Gillett (1963c). Lavin (1987, 1995) and Lavin and Sousa (1995) synonymized *Glottidium* with *Sesbania*, and then created a new combination, *Sesbania* sect. *Glottidium* (A.N. Desvaux) M. Lavin. In Lavin's opinion (personal communication, 1998), recognition of this genus renders *Sesbania* (8.01) paraphyletic. Unlike other faboid legumes, the epicarp and mesocarp portions of the valves separate and free the winged chartaceous endocarp bearing two or one seeds. The two-seeded endocarp remains intact, while in *Endosamara* the multiseeded endocarp separates into lomentlike segments, each with a single seed.

Glottidium: *G. vescarium* A.N. Desvaux (A–E). A, Fruits (dehiscent fruit and nondehiscent endocarp) ($\times 1.3$); B, seeds ($\times 3$); C–D, testa ($\times 50$, $\times 1000$); E, embryos ($\times 3$).



Genus: *Hebestigma* I. Urban

Phylogenetic Number: 8.02.

Tribe: Robinieae.

Group: *Hebestigma*.

Species Studied—Species in Genus: 1 sp.—1 sp.

Fruit a legume; unilocular; (9–)11–22 × 2–3.7 × 1.6 cm (estimated); with deciduous corolla; with deciduous calyx; without orifice formed by curving of fruit or fruit segments; straight; not plicate; not twisted; symmetrical or asymmetrical; oblong; with both sutures nearly straight; not inflated; compressed; without beak; tapered at apex; apex aligned with longitudinal axis of fruit; tapered at base; base aligned with longitudinal axis of fruit; with the apex and base uniform in texture; ligneous; seed chambers externally invisible. Fruit margin not constricted or slightly constricted along both margins; without sulcus; plain. Fruit wings absent. Fruit nonstipitate or substipitate. Fruit with all layers dehiscing; splitting along sutures. Dehiscence of valves along both sutures; apical and down; active; with valves twisting (somewhat). Replum invisible. Epicarp glossy; monochrome (including striate); brown (dark reddish to greenish); glabrous; eglandular; without spines; not smooth; with recessed features; not veined; not tuberculate; pitted (longitudinal and oblique); not exfoliating; with cracks; cracking oblique to fruit length. Mesocarp thick; surface not veined; 1-layered; without balsamic vesicles; without fibers; solid; ligneous. Endocarp dull; monochrome; tan; below seeds smooth and scurfy (between seeds); septate; with septa thicker than paper, firm; with the septa eglandular; chartaceous; not exfoliating; remaining fused to epicarp; entire. Seeds 2–8; length oblique to fruit length; neither overlapping nor touching; in 1 series. Funiculus less than 0.5 mm long; of 1 length only; triangular; straight. Aril dry. Aril tongue-aril. Aril tan.

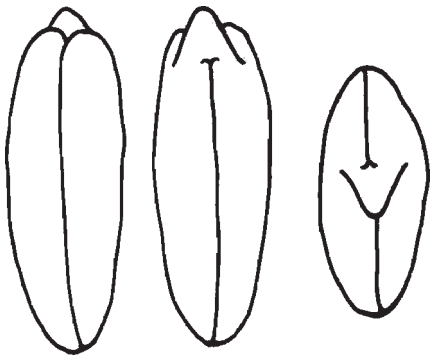
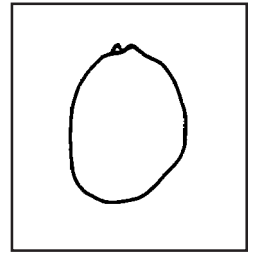
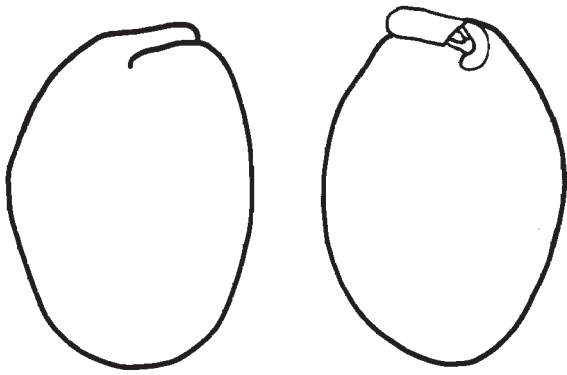
Seed 17–20 × 13–17 × 5.5–8.5 mm; not overgrown; not angular or angular (somewhat); asymmetrical or symmetrical (nearly); circular (sub), ovate, obovate, or triangular (more or less); compressed; with surface smooth; without visible radicle and cotyledon lobes; without hilar sinus; without umbo on seed faces. Testa not adhering to endocarp; glossy or dull; not modified by a bloom; colored; monochrome; brown (to dark reddish brown when older); glabrous; smooth; osseous. Fracture lines absent. Rim absent. Wings absent. Raphe

not visible. Hilum partially concealed; concealed by aril; with faboid split; with the lips of the faboid split the same color as the rest of the hilum; punctiform; apical at apex of or subapical to radicle tip; recessed; not within corona, halo, or rim. Lens not discernible. Endosperm thin; covering entire embryo; adnate to testa. Cotyledons smooth; both outer faces convex; both the same thickness; both more or less of equal length; not folded; margin entire 180 degrees from base of radicle; similar at apex; not concealing radicle; split over radicle; with lobes; without basal groin formed by lobes; with the interface division terminating at base of radicle; without margins recessed; tan (reddish); inner face flat; glabrous around base of radicle. Embryonic axis deflexed; oblique to length of seed; without a joint evident between the radicle and the cotyledons. Radicle linear; deflexed and parallel to cotyledon width; centered between cotyledons; less than 1/2 length of cotyledons. Plumule well developed; glabrous.

Distribution: Cuba.

Notes: Lavin and Sousa (1995) monographed *Hebestigma*.

Hebestigma: *H. cubense* (K.S. Kunth) I. Urban (A–E). A, Valves (× 1.2); B, seeds (× 2); C–D, testa (× 50, × 1000); E, embryos (× 2).



E



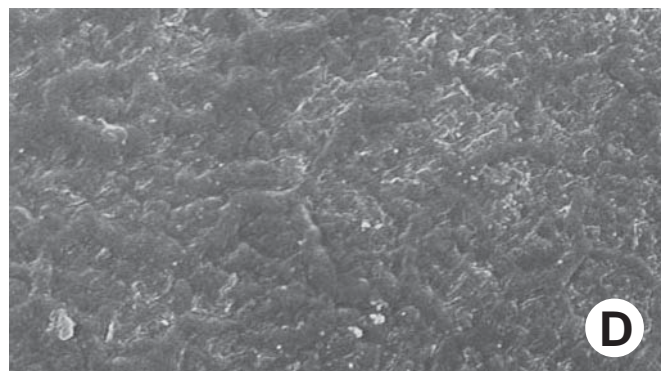
B



A



C



D

Genus: *Lennea* J.F. Klotzsch

Phylogenetic Number: 8.03.

Tribe: Robinieae.

Group: Gliricidia.

Species Studied—Species in Genus: 3 spp.—3 spp.

Fruit a legume; unilocular; $5-11 \times 1.2-2 \times 0.8$ cm; with deciduous corolla; with deciduous calyx; without orifice formed by curving of fruit or fruit segments; straight; not plicate; not twisted; asymmetrical; with 1 straight and 1 curved suture; widest near apex; not inflated; compressed; without beak; short tapered at apex; apex aligned with longitudinal axis of fruit; tapered at base; base aligned or oblique with longitudinal axis of fruit; with the apex and base uniform in texture; ligneous; seed chambers externally invisible. Fruit margin not constricted; without sulcus; plain. Fruit wings absent. Fruit nonstipitate or substipitate. Fruit with all layers dehiscent; splitting along sutures. Dehiscence of valves along both sutures; apical and down; active or passive; with valves twisting (somewhat). Replum invisible. Epicarp dull; monochrome; brown (dark reddish); glabrous; eglandular; without spines; not smooth; with elevated features; not veined; not tuberculate; wrinkled; not exfoliating; without cracks. Mesocarp thick; surface not veined; 1-layered; without balsamic vesicles; without fibers; solid; ligneous. Endocarp dull; monochrome; tan; smooth; nonseptate; coriaceous; not exfoliating; remaining fused to epicarp; entire. Seeds 1–4; length parallel with fruit length; neither overlapping nor touching; in 1 series. Funiculus less than 0.5 mm long; of 1 length only; flattened; straight. Aril dry. Aril tongue-aril.

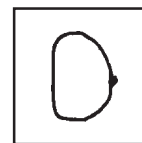
Seed $9-12 \times 8-9 \times 4.5-5.2$ mm; not overgrown; not angular or angular (somewhat); asymmetrical; D-shaped or ovate; compressed; with surface smooth; without visible radicle and cotyledon lobes; without hilar sinus; without umbo on seed faces. Testa not adhering to endocarp; glossy; not modified by a bloom; colored; bichrome (outer rim lighter than inner face though not clearly demarked like a pleurogram or pseudopleurogram); brown (dark reddish); glabrous; not smooth; with recessed features; pitted with small separate pits; coriaceous. Fracture lines absent. Rim absent. Wings absent. Raphe from hilum to lens (3/4 way around seed); not bifurcating; color of testa; raised. Hilum visible or fully concealed; concealed by funicu-

lus; with faboid split; with the lips of the faboid split the same color as the rest of the hilum; larger than punctiform; 1 mm long; with curved outline; circular; marginal according to or apical at apex of radicle tip; recessed (barely); within rim. Hilum rim color darker than testa. Lens discernible; equal to or greater than 0.5 mm in length; 1.5–1.7 mm long; with margins straight or curved; wedge-shaped or irregular; not in groove of raphe; 270 degrees from hilum; mounded; same color as testa; not within corona, halo, or rim. Endosperm thin; covering entire embryo; adnate to testa. Cotyledons not smooth; both outer faces convex; both the same thickness; 1 longer than other; not folded; margin entire 180 degrees from base of radicle; similar at apex; partially concealing radicle; entire over radicle; without lobes; with the interface division terminating at base of radicle; without margins recessed; tan (reddish); inner face flat; glabrous around base of radicle. Embryonic axis deflexed; oblique to length of seed; without a joint evident between the radicle and the cotyledons. Radicle triangular; deflexed and parallel to cotyledon width; not centered between cotyledons (radicle outside 1 cotyledon and inside other, therefore junctions for each cotyledon different) (slightly); less than 1/2 length of cotyledons. Plumule glabrous.

Distribution: Southern Mexico and Central America.

Notes: Lavin and Sousa (1995) monographed *Lennea*.

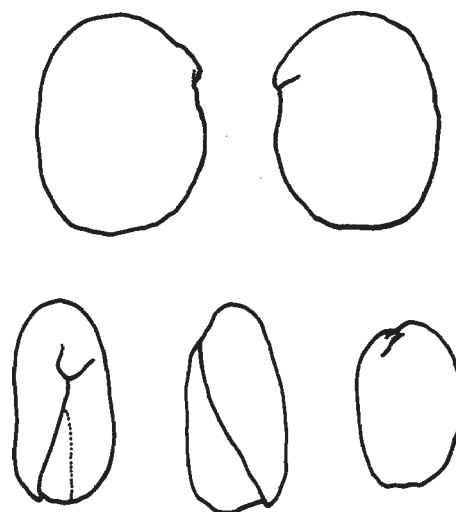
Lennea: *L. modesta* (P.C. Standley & J.A. Steyermark) P.C. Standley & J.A. Steyermark (A–E). A, Valves ($\times 1.4$); B, seeds ($\times 3.9$); C–D, testa ($\times 50$, $\times 1000$); E, embryos ($\times 3$).



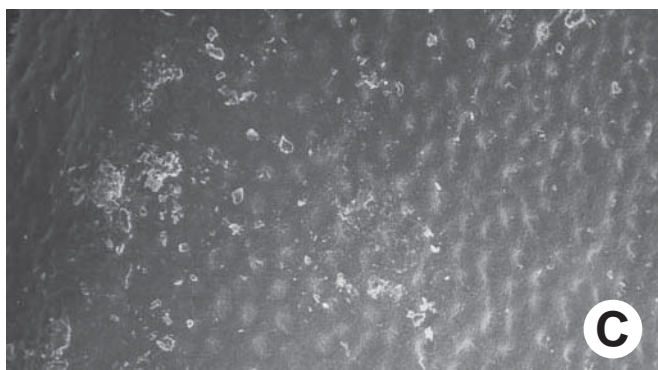
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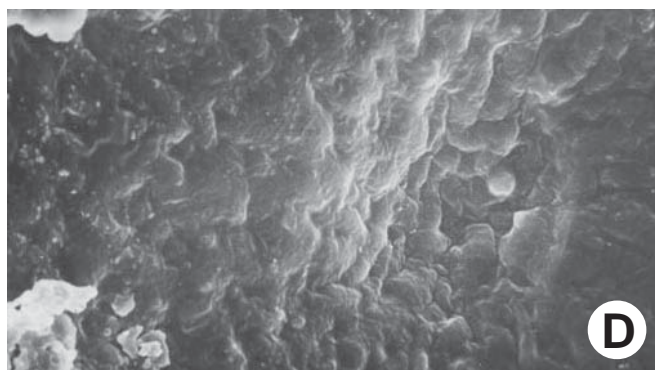
B



E



C



D

Genus: *Hybosema* H.A.T. Harms

Phylogenetic Number: 8.04.

Tribe: Robinieae.

Group: Gliricidia.

Species Studied—Species in Genus: 2 spp.—2 spp.

Fruit a legume; unilocular; $4-17 \times 0.7-2.2$ with deciduous corolla; with deciduous calyx; without orifice formed by curving of fruit or fruit segments; straight; not plicate; not twisted; symmetrical or asymmetrical; oblong (linear) or linear (broadly); with both sutures nearly straight; not inflated; flattened; without beak; short tapered at apex; apex aligned with longitudinal axis of fruit; long tapered at base; base aligned with longitudinal axis of fruit; with the apex and base uniform in texture; coriaceous; seed chambers externally visible. Fruit margin not constricted; without sulcus; plain. Fruit nonstipitate. Fruit with all layers dehiscent; splitting along sutures. Dehiscence of valves along both sutures; apical and down; active; with valves twisting. Replum invisible. Epicarp dull; monochrome; brown (reddish); glabrous; eglandular; without spines; not smooth; with elevated features; reticulately veined; not tuberculate; not exfoliating; without cracks. Mesocarp thin; surface not veined; 1-layered; without balsamic vesicles; without fibers; solid; coriaceous. Endocarp dull; monochrome; tan; spongy; septate or nonseptate; with septa thicker than paper, firm; with the septa eglandular; chartaceous; not exfoliating; remaining fused to epicarp; entire. Seeds 4–5; length transverse to fruit length; neither overlapping nor touching; in 1 series. Funiculus less than 0.5 mm long; of 1 length only; triangular; straight. Aril dry. Aril tongue-aril. Aril brown (reddish) or tan.

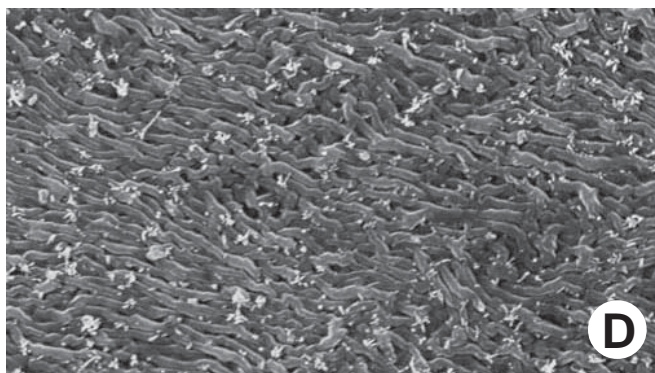
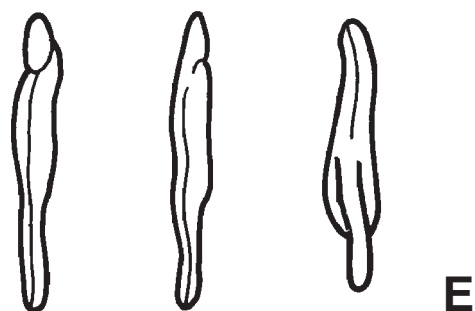
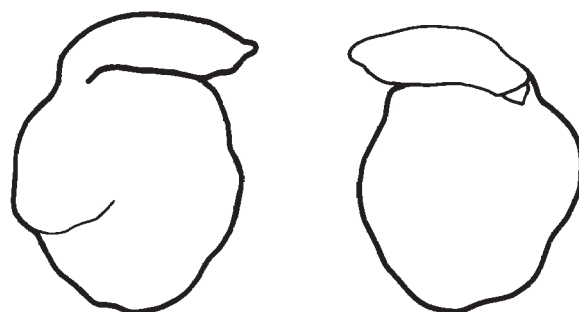
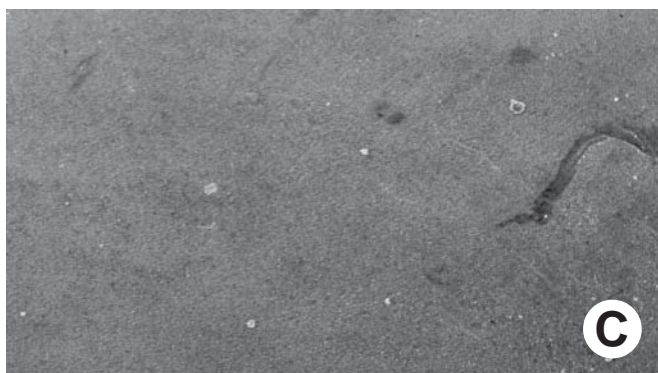
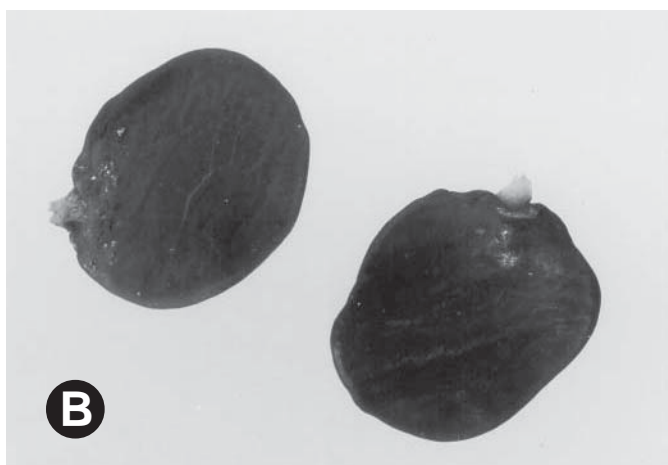
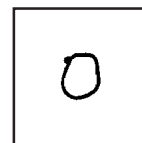
Seed $5-10 \times 5-7.5 \times 1-2.3$ mm; not overgrown; not angular; asymmetrical; circular (sub) or ovate; flattened or compressed (nearly flattened); with surface smooth; without visible radicle and cotyledon lobes; without hilar sinus; without umbo on seed faces. Testa not adhering to endocarp; dull; not modified by a bloom; colored; monochrome; brown (dark reddish); glabrous; smooth; coriaceous. Fracture lines absent. Rim absent. Wings absent. Raphe from hilum to lens; not bifurcating; color of testa; brown (reddish); recessed. Hilum partially concealed; concealed by aril; with faboid split; with the lips of the faboid split the same color as the rest of the hilum; punctiform; apical at apex of radicle

tip; recessed; within rim. Hilum rim color of testa. Lens discernible; less than 0.5 mm in length; with margins curved; elliptic; not in groove of raphe; adjacent to hilum; 1 mm from hilum; mounded; similar color as testa; not within corona, halo, or rim. Endosperm thin; covering entire embryo; adnate to testa. Cotyledons smooth; both outer faces convex; both the same thickness; both more or less of equal length; not folded; margin entire 180 degrees from base of radicle; similar at apex; not concealing radicle; split over radicle; with lobes; without basal groin formed by lobes; with the interface division terminating at base of radicle; without margins recessed; brown (dark reddish); inner face flat; glabrous around base of radicle. Embryonic axis deflexed; oblique to length of seed; without a joint evident between the radicle and the cotyledons. Radicle bulbous; deflexed and parallel to cotyledon width; centered between cotyledons; less than 1/2 length of cotyledons. Plumule moderately developed; glabrous.

Distribution: Southern and eastern Mexico and northern Central America.

Notes: Sousa and Lavin (1992) named a new species, and our species count includes their new species. Lavin and Sousa (1995) monographed *Hybosema*. We believe that the seeds we studied were all immature; hence the lower measurements for seed length, width, and thickness. The upper measurements are likely more accurate for mature seeds.

Hybosema: *H. ehrenbergii* (F.R.R. Schlechter) H.A.T. Harms (A–E). A, Valves ($\times 1.1$); B, seeds ($\times 6.2$); C–D, testa ($\times 50$, $\times 1000$); E, embryos ($\times 7$).



Genus: *Poitea* E.P. Ventenat

Phylogenetic Number: 8.05.

Tribe: Robinieae.

Group: Gliricidia.

Species Studied—Species in Genus: 9 spp.—12 spp.

Fruit a legume; unilocular; $2-11 \times 0.3-0.8 \times 0.1-0.3$ cm; with deciduous corolla; with deciduous calyx; without orifice formed by curving of fruit or fruit segments; slightly curved or straight; not plicate; not twisted; symmetrical or asymmetrical; linear or oblong; with both sutures nearly straight, or unequally curved; not inflated; flattened or compressed; without beak; short tapered at apex; apex aligned with longitudinal axis of fruit; long tapered, tapered, or short tapered at base; base aligned or oblique (slightly) with longitudinal axis of fruit; with the apex and base uniform in texture; coriaceous; seed chambers externally visible; with the raised seed chambers not torulose or torulose. Fruit margin not constricted or slightly constricted along both margins; without sulcus; plain. Fruit wings absent. Fruit substipitate or nonstipitate. Fruit with all layers dehiscent; splitting along sutures. Dehiscence of valves along both sutures; apical and down; active; with valves twisting (or rarely, loosely). Replum invisible. Epicarp dull; monochrome; reddish brown; glabrous; eglandular; without spines; not smooth or smooth (rarely); with elevated features; not veined or reticulately veined; not tuberculate; wrinkled (obliquely); not exfoliating or exfoliating in part; without cracks or with cracks; cracking oblique (across each seed chamber) or transverse to fruit length. Mesocarp thin; surface not veined; 1-layered; without balsamic vesicles; without fibers; solid or vitreous (granules); coriaceous. Endocarp dull; monochrome; tan or green; below seeds smooth and scurfy (sometimes around seeds); subseptate or nonseptate; with septa thin (tissue paper-like), flexible or thicker than paper, firm; with the septa eglandular; coriaceous or chartaceous; not exfoliating; remaining fused to epicarp; entire. Seeds 1–24; length transverse to fruit length; neither overlapping nor touching; in 1 series. Funiculus less than 0.5 mm long; of 1 length only; triangular or flattened; straight. Aril absent or present; dry. Aril tongue-aril. Aril tan.

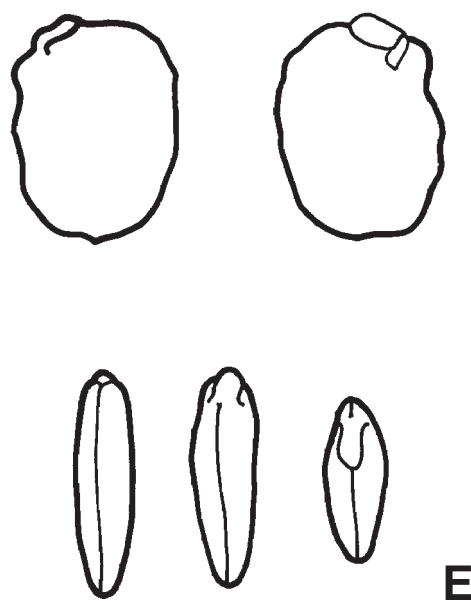
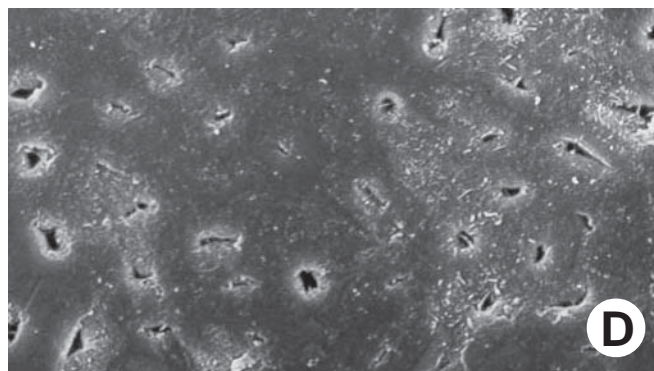
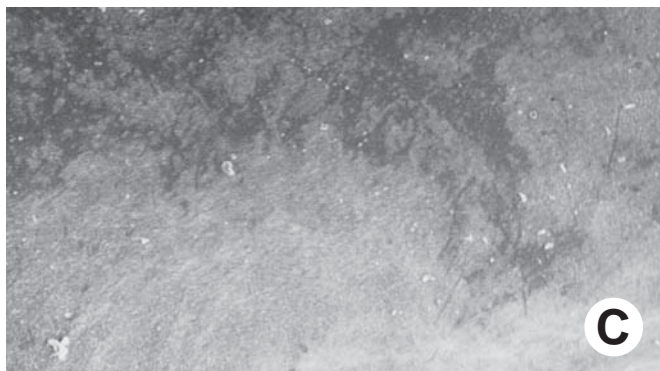
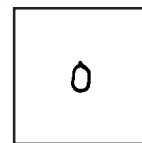
Seed $3-5 \times 2.5-4.5 \times 0.8-1.5$ mm; not overgrown; not angular; asymmetrical; circular, ovate, rectangular, reniform, obovate, or oblong; compressed (rarely to

subcircular); with surface smooth; without or with visible radicle and cotyledon lobes; without or with external groove between radicle and cotyledon lobes; with external groove between radicle and cotyledon lobes same color as testa; without hilar sinus; without umbo on seed faces. Testa not adhering to endocarp; glossy or dull; not modified by a bloom; colored; monochrome or bichrome (outer margin darker than inner face like a pseudopleurogram); dark reddish brown; glabrous; smooth; coriaceous. Fracture lines absent. Rim absent. Wings absent. Raphe visible (or barely so) or not visible; from hilum to lens, from lens to base of seed and terminating, or from hilum through lens to base of seed and bifurcating; not bifurcating or bifurcating at base of seed with each arm going up antiraphe side, turning (U-shaped) down, and approaching bifurcation; darker than testa (or barely so); dark reddish brown or black; flush or recessed. Hilum visible or partially or fully concealed; concealed by funicular remnant; with faboid split; with the lips of the faboid split the same color as the rest of the hilum; punctiform or larger than punctiform; 0.5 mm long; with curved outline; circular; apical at apex of radicle tip, between cotyledon and radicle lobe, or marginal according to radicle tip; recessed; not within corona, halo, or rim. Lens discernible (or barely so) or not discernible; less than 0.5 mm or equal to or greater than 0.5 mm in length; 0.5 mm long; with margins straight or curved; linear, oblong, or irregular; not in groove of raphe; 180 degrees (to 270 degrees) from or confluent with hilum; mounded to flush; similar or dissimilar color from testa; darker or lighter than testa; dark reddish brown or black; not within corona, halo, or rim. Endosperm thin; covering entire embryo; adnate to testa or to embryo. Cotyledons smooth; both outer faces convex; both the same thickness; both more or less of equal length; not folded; margin entire 180 degrees from base of radicle; similar at apex; not concealing or partially concealing radicle; entire or split over radicle; with or without lobes; with lobes not touching; without basal groin formed by lobes; with the interface division terminating at base of radicle; without margins recessed; greenish to reddish tan, green, or brown (reddish); inner face flat; glabrous around base of radicle. Embryonic axis deflexed; oblique to length of seed; without a joint evident between the radicle and the cotyledons. Radicle linear or bulbous; lobe tip straight; deflexed and parallel to cotyledon width or length; centered between cotyledons; less than 1/2 or 1/2 to nearly length of cotyledons. Plumule moderately developed or rudimentary; glabrous.

Distribution: Cuba, Haiti, Dominican Republic, Puerto Rico, Greater Antilles, and the island of Dominica.

Notes: Lavin (1993) monographed *Poitea*, and our species count is taken from his monograph, not from Polhill and Sousa (1981). Lavin reduced *Corynella*, *Notodon*, *Sabinea*, and *Sauvallela* to synonyms under *Poitea*.

Poitea: *P. galegeoides* É.P. Ventenat (*B–E*), *P. spp.* (*A*). *A*, Fruits ($\times 1.2$); *B*, seeds ($\times 7.5$); *C–D*, testa ($\times 50$, $\times 1000$); *E*, embryos ($\times 8$).



Genus: *Gliricidia* K.S. Kunth

Phylogenetic Number: 8.06.

Tribe: Robinieae.

Group: *Gliricidia*.

Species Studied—Species in Genus: 3 spp.—3 spp.

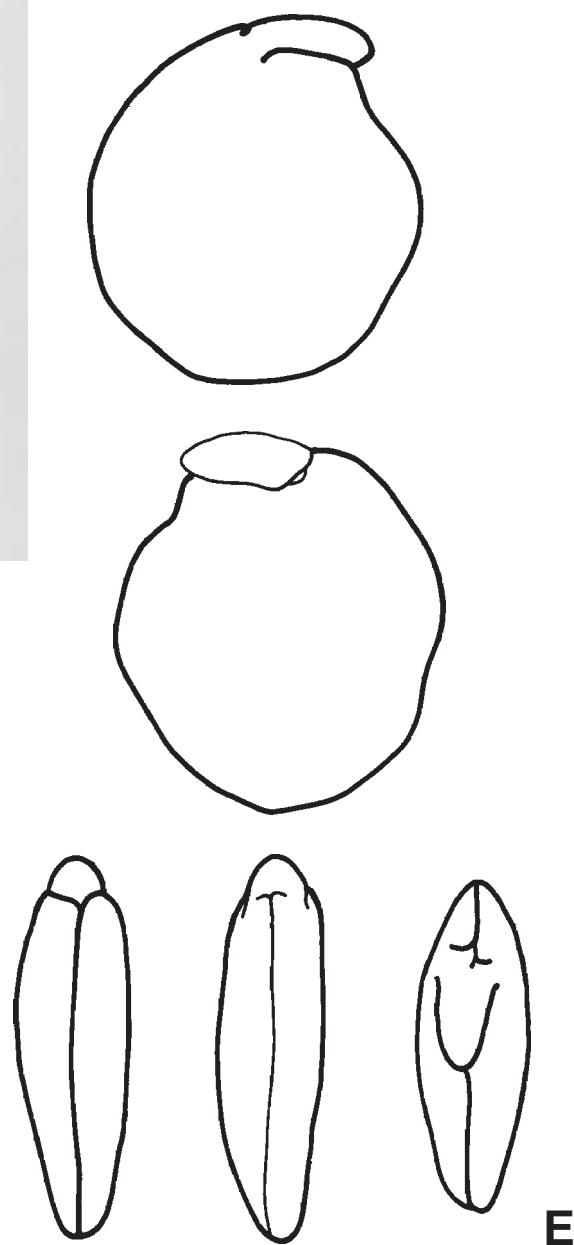
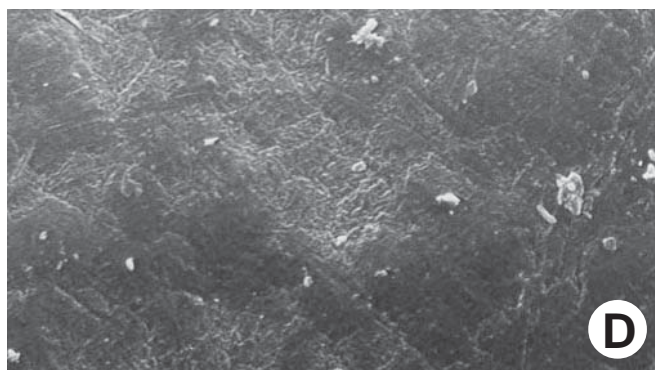
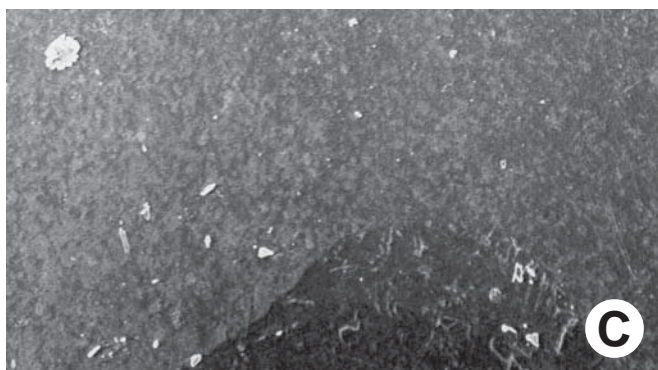
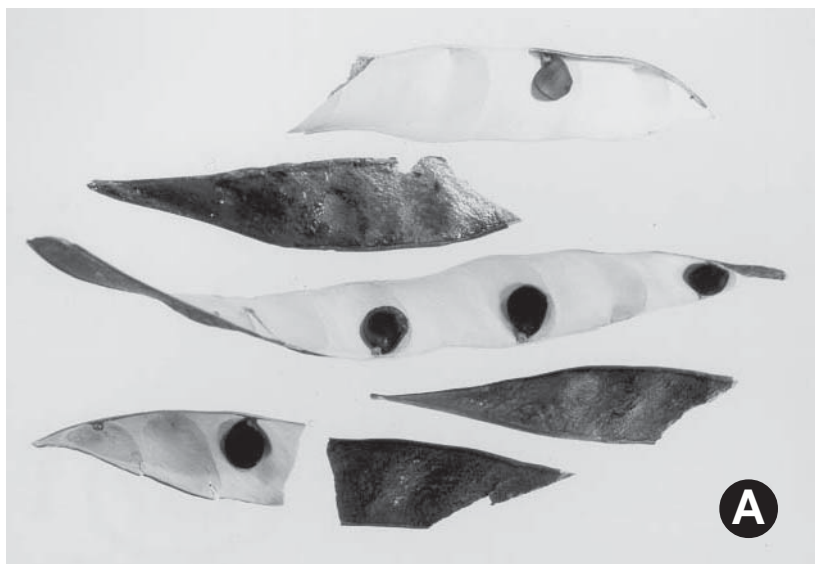
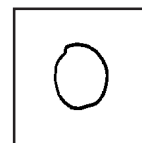
Fruit a legume; unilocular; (6–)8–31 × 1–2.5 × 0.2–0.5 cm; with persistent or deciduous calyx; with calyx shorter than fruit; without orifice formed by curving of fruit or fruit segments; straight; not plicate; not twisted; symmetrical or asymmetrical; linear; when asymmetrical with both sutures nearly straight; not inflated; flattened; without beak; short tapered at apex; apex aligned with longitudinal axis of fruit; long tapered at base; base aligned with longitudinal axis of fruit; with the apex and base uniform in texture; ligneous; seed chambers externally visible (faintly) or invisible; with the raised seed chambers not torulose. Fruit margin not constricted; without sulcus; plain. Fruit wings absent. Fruit substipitate or nonstipitate. Fruit with all layers dehiscent. Dehiscence of valves along both sutures; basal and up (*G. maculata* (K.S. Kunth) K.S. Kunth ex G.W. Walpers and *G. sepium*) or apical and down (*G. brenningii* (H.A.T. Harms) M. Lavin); active; with valves twisting. Replum invisible. Epicarp dull or semiglossy; monochrome; reddish or dark reddish brown; with surface texture uniform; glabrous; eglandular; without spines; not smooth; with elevated features; not veined or veined; reticulately veined; not tuberculate; faintly wrinkled or wrinkled and lenticular; not exfoliating; without or with (after dehiscence, *G. brenningii*) cracks; cracking transverse to fruit length. Mesocarp thick; surface not veined; 2-layered; without balsamic vesicles; without fibers; with vitreous layer over solid layer (vitreous layer beadlike or reddish brown and solid layer tan); ligneous. Endocarp dull; monochrome; tan; spongy; septate or nonseptate; with septa thin (tissue paper-like), flexible (more of a color difference or with wrinkled margins); with septa eglandular; coriaceous or chartaceous; not exfoliating; remaining fused to mesocarp and epicarp; entire. Seeds 1–15; length parallel with, transverse to, or oblique to fruit length; neither overlapping nor touching; in 1 series. Funiculus measured or less than 0.5 mm long (*G. brenningii*); 1.5–2 mm long; of 1 length only; flattened; straight. Aril absent or present; dry; tongue-aril; reddish brown or brown.

Seed 5.5–12 × 1–10 × 1.5–3 mm; not overgrown; not angular; nearly symmetrical or asymmetrical; subcircular, circular, oblong, or ovate; flattened or compressed; with surface smooth; without visible radicle and cotyledon lobes; without hilar sinus; without umbo on seed faces. Testa not adhering to endocarp; glossy or dull; not modified by a bloom; colored; monochrome; black or brown (reddish); glabrous; smooth or not smooth (*G. brenningii*); with elevated features; wrinkled; coriaceous. Fracture lines absent. Rim absent. Wings absent. Raphe not visible. Hilum visible or fully concealed; concealed by funiculus or funicular remnant; with faboid split; with the lips of the faboid split the same color as the rest of the hilum; larger than punctiform; 1 mm long; with straight outline; oblong; apical at apex of radicle tip; flush or recessed (slightly, *G. brenningii*); not within corona, halo, or rim or within rim. Hilum rim color of testa. Lens not discernible or discernible; less than 0.5 mm in length or equal to or greater than 0.5 mm in length (*G. brenningii*); up to 2 mm long; with margins straight; rhombic or wedge-shaped; not in groove of raphe; adjacent to hilum; 1–1.5 mm from hilum; mounded or flush (*G. brenningii*); dissimilar color from or similar color as testa; darker or lighter (duller, *G. brenningii*) than testa; reddish brown; not within corona, halo, or rim. Endosperm thin; covering entire embryo; adnate to testa or embryo. Cotyledons smooth; both outer faces convex or outer face of 1 cotyledon flat and other cotyledon convex (*G. brenningii*); both the same thickness; both more or less of equal length; not folded; margin entire 180 degrees from base of radicle; similar at apex; completely concealing or not concealing (*G. brenningii*) radicle; split over radicle; with lobes; without basal groin formed by lobes; with the interface division terminating at base of radicle; without or with (*G. brenningii*) margins recessed; tan, brown (reddish), or green; inner face flat; glabrous around base of radicle. Embryonic axis deflexed; oblique to length of seed; without a joint evident between the radicle and the cotyledons. Radicle bulbous; deflexed and parallel to cotyledon width; centered between cotyledons; less than 1/2 length of cotyledons. Plumule moderately developed or rudimentary; glabrous.

Distribution: Southern Mexico, Central America, and Pacific slope of Ecuador and northernmost Peru; widely cultivated.

Notes: Lavin et al. (1991) reported on the intraspecific phylogeny and tokogeny of *Gliricidia sepium*. Lavin and Sousa (1995) monographed the genus and synonymized *Yucaratonia* A.E. Burkart with it. Burkart (1969) provided excellent fruit and seed illustrations of *G. brenningii* with his description of the genus *Yucaratonia*.

Gliricidia: *G. sepium* (N. von Jacquin) K.S. Kunth ex G.W. Walpers (*A, C–E*), *G. spp.* (*B*). *A*, Dehisced fruit and valves ($\times 0.7$); *B*, seeds ($\times 5$); *C–D*, testa ($\times 50$, $\times 1000$); *E*, embryos ($\times 5$).



Genus: *Robinia* C. Linnaeus

Phylogenetic Number: 8.07.

Tribe: Robinieae.

Group: Robinia.

Species Studied—Species in Genus: 4 spp.—4 spp.

Fruit a legume; unilocular; $4.5\text{--}10 \times 0.8\text{--}1 \times 0.2$ cm; with deciduous corolla; with deciduous calyx; without orifice formed by curving of fruit or fruit segments; straight or curved (slightly); not plicate; not twisted; symmetrical or asymmetrical; linear; with both sutures nearly straight; not inflated; flattened or compressed; without or with beak; with solid beak the same color and texture as fruit; tapered at apex; apex aligned with longitudinal axis of fruit; short tapered at base; base aligned with longitudinal axis of fruit; with the apex and base uniform in texture; coriaceous; seed chambers externally invisible or visible; with the raised seed chambers not torulose. Fruit margin not constricted or constricted along both margins; without sulcus; plain or embellished. Fruit wing absent or present (occasionally); 1; up to 0.2 mm wide; sutural; on 1 suture (upper). Fruit substipitate. Fruit with all layers dehiscent; splitting along sutures. Dehiscence of valves along both sutures (lower suture first); apical and down; active; with valves twisting. Replum invisible. Epicarp dull; monochrome or multicolored; streaked; brown (reddish); with red overlay; glabrous or pubescent and indurate; with 1 type of pubescence; puberulent; with pubescence gray; with pubescence uniformly distributed; with simple hairs; pliable; with hair bases plain; glandular; with glandular hairs; with spines; not smooth; with elevated or recessed features; veined or not veined; reticulately veined (faintly and incompletely); tuberculate; warty; slitted obliquely (minute); not exfoliating; without cracks. Mesocarp thin; surface not veined; 1-layered; without balsamic vesicles; without fibers; solid; coriaceous. Endocarp dull; monochrome; tan; smooth; septate or nonseptate; with septa thicker than paper, firm; with the septa eglandular; chartaceous; not exfoliating; remaining fused to epicarp; entire. Seeds 2–13; length transverse to fruit length; neither overlapping nor touching; in 1 series. Funiculus measured; up to 1.5 mm long; of 1 length only; thick; straight or curved (near hilum). Aril dry. Aril rim-aril. Aril tan.

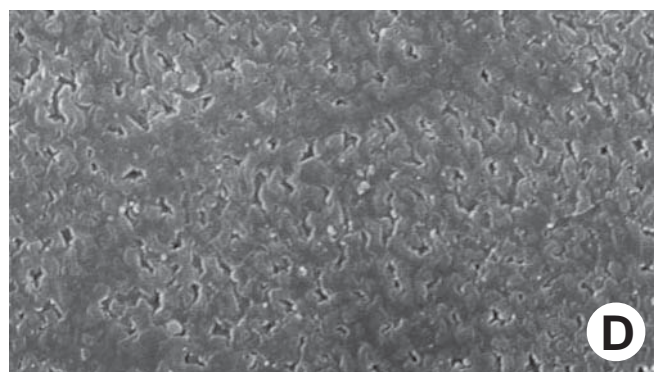
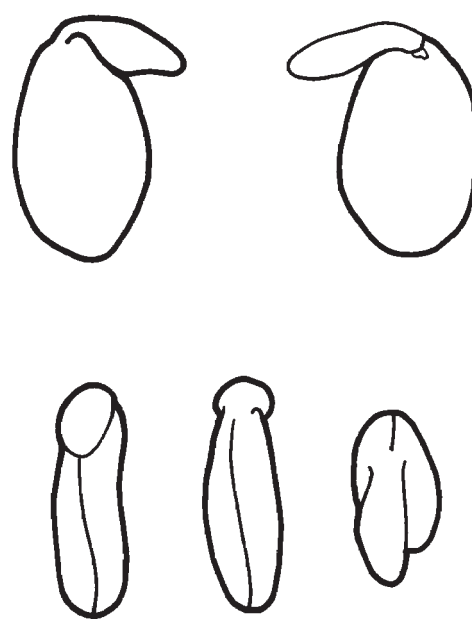
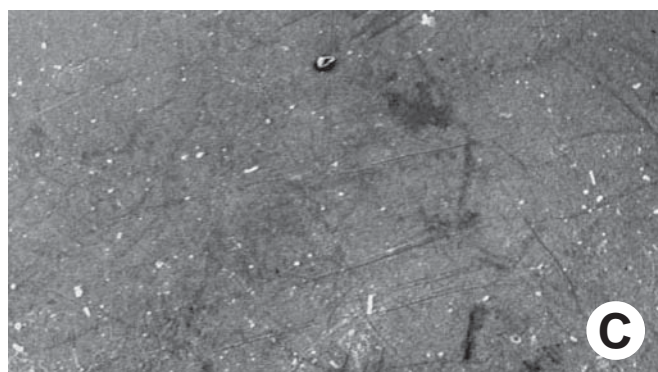
Seed $4\text{--}6 \times 3\text{--}3.5 \times 1.7\text{--}2$ mm; not overgrown; not angular; asymmetrical; reniform or ovate; compressed; with surface smooth; with or without visible radicle and cotyledon lobes; without external groove between radicle and cotyledon lobes; without hilar sinus; without umbo on seed faces. Testa not adhering to endocarp; glossy or dull; not modified by a bloom; colored; monochrome or mottled and streaked; with frequent mottles; with frequent streaks; brown (reddish) or black; with black overlay; glabrous; smooth; coriaceous. Fracture lines absent. Rim absent. Wings absent. Raphe from hilum through lens to base of seed and terminating; not bifurcating; color of testa; brown (reddish); flush. Hilum visible or fully concealed; concealed by funiculus; with faboid split; with the lips of the faboid split the same color as the rest of the hilum; larger than punctiform; 0.5–0.8 mm long; with curved outline; circular; marginal according to radicle tip; recessed; within halo. Hilum halo color lighter than testa. Lens discernible; equal to or greater than 0.5 mm in length; 0.7–0.8 mm long; with margins curved; circular or elliptic; not in groove of raphe; adjacent to hilum; 0.8 mm from hilum; mounded; similar color as testa; darker than testa; brown (reddish); not within corona, halo, or rim. Endosperm thin; covering entire embryo; adnate to testa or embryo. Cotyledons smooth; both outer faces convex; both the same thickness; both more or less of equal length; not folded; margin entire 180 degrees from base of radicle; similar at apex; not concealing radicle; split over radicle; with lobes; without basal groin formed by lobes; with the interface division terminating at base of radicle; without margins recessed; tan; inner face flat; glabrous around base of radicle. Embryonic axis deflexed; oblique to length of seed; without a joint evident between the radicle and the cotyledons. Radicle bulbous; lobe tip straight; deflexed and parallel to cotyledon length; centered between cotyledons; less than 1/2 length of cotyledons. Plumule rudimentary or moderately developed; glabrous.

Distribution: United States and Mexico.

Notes: Isely and Peabody (1984) and Lavin and Sousa (1995) recognized only four species, as we do, rather than the 10(–20) acknowledged by Polhill and Sousa (1981), who added this caveat, “Perhaps only four or five basic species.”

Robinia: *R. pseudoacacia* C. Linnaeus (C–E), *R. spp.* (A–B). A, Fruits and valves ($\times 1.2$); B, seeds ($\times 6.6$); C–D, testa ($\times 50$, $\times 1000$); E, embryos ($\times 6$).

σ



Genus: *Coursetia* A.-P. de Candolle

Phylogenetic Number: 8.08.

Tribe: Robinieae.

Group: Robinia.

Species Studied—Species in Genus: 19 spp.—39 spp.

Fruit a legume; unilocular; $1-17 \times 0.2-1.1 \times 0.1-0.15$ cm; with deciduous corolla; with deciduous calyx; without orifice formed by curving of fruit or fruit segments; straight or curved (or slightly curved); not plicate; not twisted; symmetrical or asymmetrical; linear, oblong (linear), or falcate; with both sutures nearly straight; not inflated; flattened or compressed; without beak; tapered or short tapered at apex; apex aligned with longitudinal axis of fruit; tapered or short tapered at base; base oblique with longitudinal axis of fruit; with the apex and base uniform in texture; coriaceous; seed chambers externally visible; with the raised seed chambers torulose or not torulose. Fruit margin constricted or not constricted; constricted or slightly constricted along both margins; without sulcus; plain. Fruit wings absent. Fruit stipitate, substipitate, or nonstipitate; with the stipe up to 20 mm long. Fruit with all layers dehiscing; splitting along sutures. Dehiscence of valves along both sutures; apical and down; active; with valves twisting. Replum invisible. Epicarp dull; monochrome; reddish to greenish brown; glabrous or pubescent and indurate; with 1 or 2 types of pubescence (glandular and nonglandular hairs); puberulent, tomentose, villous, or sericeous; with pubescence gray or golden; with pubescence uniformly distributed; with simple hairs; pliable; with hair bases plain; eglandular or glandular; with glandular hairs; without or with (rarely) spines; not smooth; with elevated features; not veined; not tuberculate; rugose, warty, or wrinkled; not exfoliating or exfoliating in part; without cracks. Mesocarp thin, thick, or trace; surface not veined; 1-layered; with balsamic vesicles; without fibers; solid or mealy (reddish-brown); coriaceous or chartaceous. Endocarp glossy; monochrome; tan (to grayish) or gray; smooth, scurfy (large segments), or fibrous; septate (false septa according to Lavin (1988)) or nonseptate; with septa thicker than paper, firm; with the septa eglandular; coriaceous or chartaceous; not exfoliating; separating from epicarp (traces of mesocarp tissue remaining adnate to both epicarp and endocarp); entire. Seeds 1–30; length parallel with or transverse to fruit length;

neither overlapping nor touching; in 1 series.

Funiculus less than 0.5 mm long; of 1 length only; thick; straight. Aril present or absent (may remain with funiculus in fruit); dry. Aril rim-aril or tongue-aril. Aril tan.

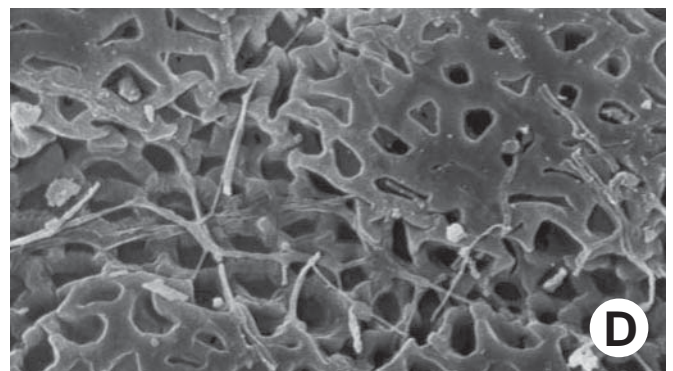
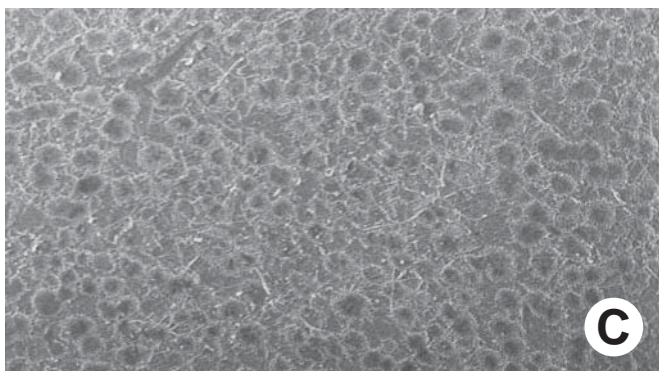
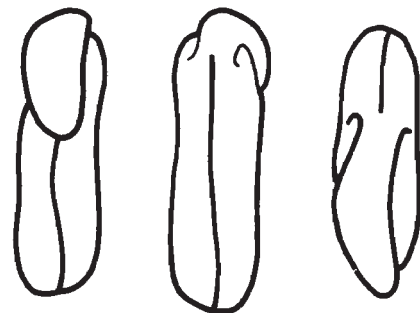
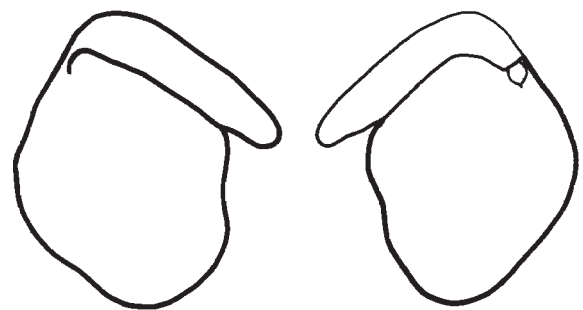
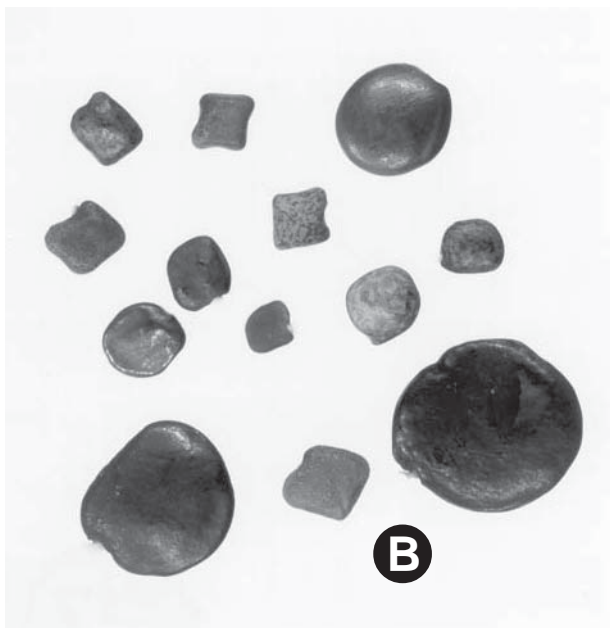
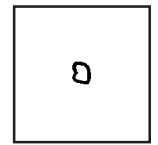
Seed $1.5-7 \times 1.5-7 \times 0.5-1.7$ mm; not overgrown; not angular or angular; asymmetrical; circular (more or less), D-shaped, ovate, quadrangular, or rectangular; compressed; with surface smooth; without or with visible radicle and cotyledon lobes; without external groove between radicle and cotyledon lobes; without hilar sinus; without umbo on seed faces. Testa not adhering to endocarp; dull; not modified by a bloom; colored; monochrome or mottled; with frequent mottles; brown (reddish), black, or gray; with black or purple overlay; glabrous; smooth or not smooth; with elevated features; tuberculate or warty; coriaceous. Fracture lines absent. Rim present. Wings absent. Raphe from hilum through lens to base of seed and terminating, from hilum to lens, or from hilum through lens and base of seed to point opposite hilum; not bifurcating; darker than testa; reddish brown; flush. Hilum partially concealed or visible; concealed by funicular remnant; with faboid split; with the lips of the faboid split the same color as the rest of the hilum; punctiform; apical at apex of or subapical to radicle tip; recessed (barely); within rim or halo. Hilum halo color lighter than testa. Hilum rim color of or lighter than testa. Lens discernible or not discernible; less than 0.5 mm in length; with margins straight or curved; triangular; circular or elliptic; not in groove of raphe; adjacent to or confluent with hilum; up to 1 mm from hilum; flush, mounded (to barely so), or recessed; same, similar, or dissimilar color from testa; darker than testa; brown (reddish); not within corona, halo, or rim. Endosperm thin; covering entire embryo; adnate to testa or embryo. Cotyledons smooth; both outer faces convex; both the same thickness; both more or less of equal length; not folded or with only 1 folded; not sufficiently folded for inner face to touch itself; portions of inner folded face unequal; margin entire 180 degrees from base of radicle; similar at apex; not concealing radicle; split over radicle; with lobes; without basal groin formed by lobes; with the interface division terminating at base of radicle; without margins recessed; tan (to greenish or reddish); inner face flat; glabrous around base of radicle. Embryonic axis deflexed; oblique to length of seed; without a joint evident between the radicle and the cotyledons. Radicle

linear or bulbose (somewhat); lobe tip straight; deflexed and parallel to cotyledon length; centered between cotyledons; less than 1/2 or 1/2 to nearly length of cotyledons. Plumule rudimentary or moderately developed; glabrous.

Distribution: Southwestern United States, Mexico, West Indies (1 sp.), northern and western South America to Argentina.

Notes: Lavin (1987) and Polhill (1994a,b) included *Cracca*, *Neocracca*, and *Poissonia* in *Coursetia*, and these genera were recognized by Polhill and Sousa (1981). Lavin (1988) monographed *Coursetia*, and his species count is used instead of the count by Polhill and Sousa. Lavin (1988) used the outline of the fruit's seed compartment as one key character for separating sections *Madrenses*, *Poissonia*, and *Coursetia* from sections *Neocracca* and *Craccoides*. The former three sections have rounded seed compartments, and the latter two have squarish seed compartments. He also noted that unlike other genera in the Robinieae, the seeds are in compartments formed "by the lateral adhesion of the inner epidermis of each valve between seeds." Figure 8 of Lavin (1988) shows that the endocarps of the valves touch, without fusing, to form the seed compartments. Where the endocarps touch each other, they are functionally septa.

Coursetia: *C. caribaea* (N. von Jacquin) M. Lavin (*C–E*),
C. spp. (*A–B*). *A*, Fruits ($\times 1$); *B*, seeds ($\times 4.2$); *C–D*,
testa ($\times 50$, $\times 1000$); *E*, embryos ($\times 12$).



Genus: *Olneya* A. Gray

Phylogenetic Number: 8.09.

Tribe: Robinieae.

Group: Robinia.

Species Studied—Species in Genus: 1 sp.—1 sp.

Fruit a legume; unilocular; $2.5\text{--}13 \times 1\text{--}1.5 \times 0.75\text{--}1$ cm; with deciduous corolla; with persistent or deciduous calyx; with calyx shorter than fruit; without orifice formed by curving of fruit or fruit segments; straight or curved (slightly); not plicate; not twisted; asymmetrical or symmetrical; moniliform or oblong; with both sutures parallelly or unequally curved; moniliform, oblong; irregular; not inflated; terete; without beak; short tapered at apex; apex oblique with longitudinal axis of fruit; tapered at base; base aligned or oblique with longitudinal axis of fruit; with the apex and base uniform in texture; ligenous; seed chambers externally visible; with the raised seed chambers torulose or not torulose. Fruit margin constricted along both margins; without sulcus; plain. Fruit wings absent. Fruit nonstipitate. Fruit with all layers dehiscing (to tardily so); splitting along sutures. Dehiscence of valves along both sutures; apical and down; passive. Replum invisible. Epicarp dull; monochrome or multicolored; mottled (when young); brown (to yellowish or greenish or reddish); with red overlay; with mottling over seed chambers; pubescent and indurate; with 1 type of pubescence; puberulent (minute); with pubescence gray; with pubescence uniformly distributed; with simple hairs; pliable; with hair bases plain; glandular; with glandular setae; without spines; not smooth; with elevated features; not veined; not tuberculate; wrinkled; not exfoliating; without cracks. Mesocarp thin; surface not veined; 1-layered; without balsamic vesicles; without fibers; vitreous; coriaceous. Endocarp dull; monochrome; tan; smooth; nonseptate; coriaceous; not exfoliating; remaining fused to epicarp; entire. Seeds 1–11; length parallel with fruit length; neither overlapping nor touching; in 1 series. Funiculus less than 0.5 mm long; of 1 length only; flattened; straight. Aril absent.

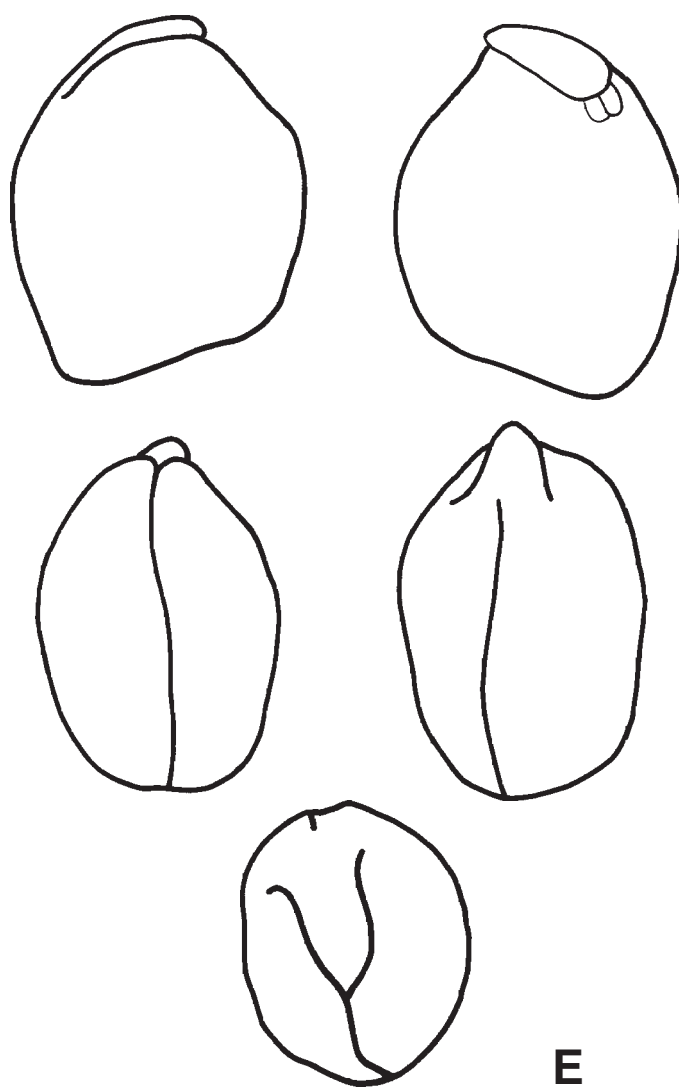
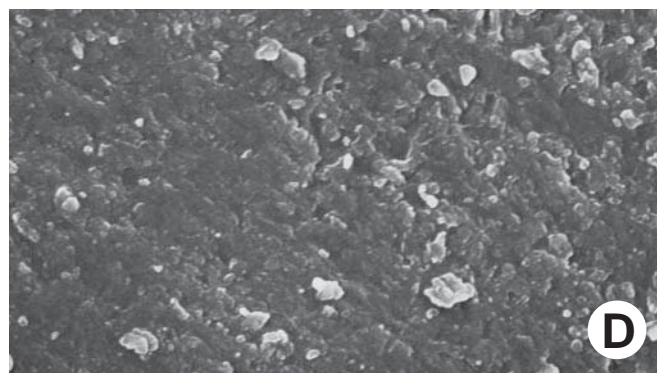
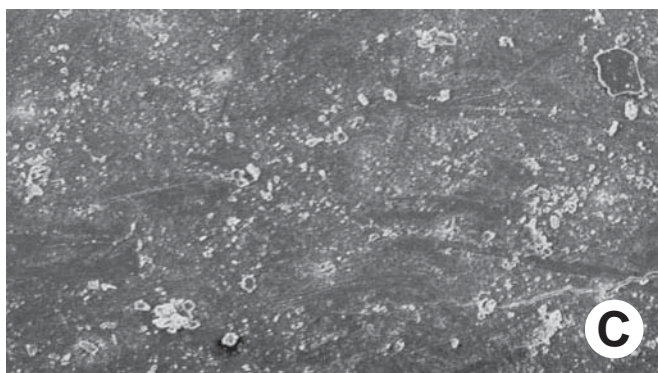
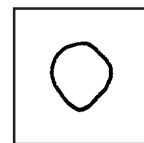
Seed $9\text{--}12 \times 6.5\text{--}9.2 \times 5.5\text{--}8$ mm; not overgrown; not angular or angular; asymmetrical; oblong; terete; with surface smooth; without visible radicle and cotyledon lobes; without hilar sinus; without umbo on seed faces. Testa not adhering to endocarp; glossy or dull; not modified by a bloom; colored; monochrome or mottled;

brown (reddish), purple (grayish to brownish dark), or black; with purple (pinkish) or pink overlay; glabrous; not smooth; with recessed features; pitted with stomata in the bottom of the pits; coriaceous. Fracture lines absent. Rim absent. Wings absent. Raphe not visible. Hilum partially concealed; concealed by funicular remnant; with faboid split; with the lips of the faboid split the same color as the rest of the hilum; larger than punctiform; 1 mm long; with curved outline; circular; subapical or marginal according to radicle tip (near apex); flush; not within corona, halo, or rim. Lens discernible; equal to or greater than 0.5 mm in length; 2.5–3 mm long; with margins straight; linear; not in groove of raphe; adjacent to hilum; 0.3–0.5 mm from hilum; mounded; same color as testa; not within corona, halo, or rim. Endosperm thin; covering entire embryo; adnate to testa. Cotyledons smooth; both outer faces convex; both the same thickness; both more or less of equal length; not folded; margin entire 180 degrees from base of radicle; similar at apex; partially concealing radicle; with lobes; with lobes not touching; without basal groin formed by lobes; with the interface division terminating at base of radicle; without margins recessed; tan; inner face flat; glabrous around base of radicle. Embryonic axis deflexed; oblique to length of seed; without a joint evident between the radicle and the cotyledons. Radicle triangular; lobe tip straight; deflexed and parallel to cotyledon width; centered between cotyledons; less than 1/2 length of cotyledons. Plumule moderately developed; glabrous.

Distribution: Southwestern United States and northern Mexico (Sonoran Desert).

Notes: Lavin and Sousa (1995) monographed *Olneya*. Cook (1919) evaluated the edibility of the young pods and seeds, and Clarke (1977) reported that native Americans ate the seeds and ground them into flour. The Seri Indians of Sonora, Mexico, extensively utilize *Olneya* as a food source, in medicine, in the production of firewood, tools, weapons, musical instruments, and sculptures, and in their religious ceremonies (Felger and Moser 1985).

Olneya: *O. tesota* A. Gray (A–E). A, Fruits and valve ($\times 1.3$); B, seeds ($\times 2.7$); C–D, testa ($\times 50$, $\times 1000$); E, embryos ($\times 5$).



Genus: *Peteria* A. Gray

Phylogenetic Number: 8.10.

Tribe: Robinieae.

Group: Robinia.

Species Studied—Species in Genus: 4 spp.—4 spp.

Fruit a legume; unilocular; $3.5\text{--}7 \times 0.4\text{--}0.65 \times 0.25\text{--}0.3$ cm; with persistent or deciduous androecial sheath; with deciduous corolla; with persistent or deciduous calyx; with calyx shorter than fruit; without orifice formed by curving of fruit or fruit segments; straight; not plicate; not twisted; symmetrical or asymmetrical; linear; with both sutures nearly straight; not inflated; compressed; with or without beak; declined or hooked; with solid beak the same color and texture as fruit; tapered at apex; apex right-angled with longitudinal axis of fruit; long tapered or tapered at base; base aligned with longitudinal axis of fruit; with the apex and base uniform in texture; coriaceous; seed chambers externally visible; with the raised seed chambers not torulose or torulose. Fruit margin not constricted (usually) or constricted (through seed abortion); constricted along both margins; without sulcus; plain. Fruit wings absent. Fruit nonstipitate. Fruit with all layers dehiscing; splitting along sutures. Dehiscence of valves along both sutures; apical and down; active; with valves twisting. Replum invisible. Epicarp dull; monochrome; brown (reddish); glabrous; eglandular; without spines; not smooth; with elevated features; reticulately veined; not tuberculate; not exfoliating; without cracks. Mesocarp thin; surface not veined; 1-layered; without balsamic vesicles; without fibers; solid; coriaceous. Endocarp dull; monochrome; tan; smooth; nonseptate; chartaceous; not exfoliating; remaining fused to epicarp; entire. Seeds 2–7; length parallel with fruit length; neither overlapping nor touching; in 1 series. Funiculus less than 0.5 mm long; of 1 length only; flattened; straight. Aril dry. Aril rim-aril (better developed along one side of hilum). Aril white.

Seed $3\text{--}6 \times 2.5\text{--}3.5 \times 2\text{--}2.6$ mm; not overgrown; not angular or angular; asymmetrical; oblong, quadrangular, or reniform (somewhat); compressed or terete; with surface smooth; with or without visible radicle and cotyledon lobes; without external groove between radicle and cotyledon lobes; without hilar sinus; without umbo on seed faces. Testa not adhering to

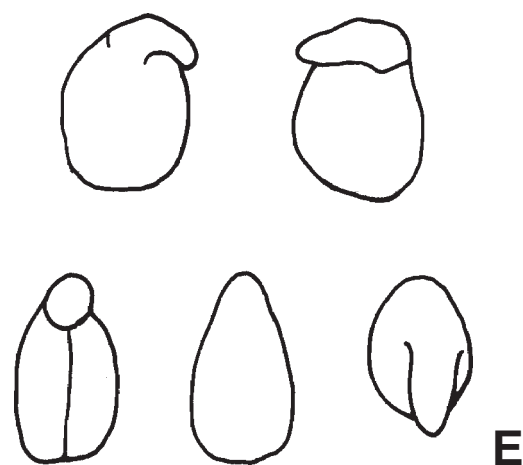
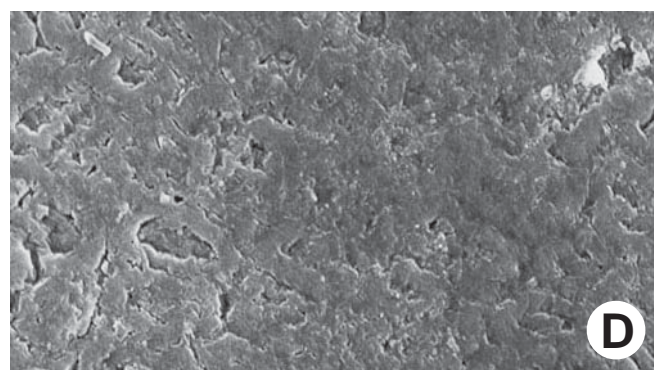
endocarp; dull; not modified by a bloom; colored; monochrome or mottled and streaked; with frequent mottles; with frequent streaks; brown (reddish); with black or purple overlay; glabrous; smooth; coriaceous. Fracture lines absent. Rim absent. Wings absent. Raphe not visible. Hilum visible; with faboid split; with the lips of the faboid split the same color as the rest of the hilum; punctiform or larger than punctiform; 0.3–0.5 mm long; with curved outline; circular or elliptic; marginal according to radicle tip or between cotyledon and radicle lobe; recessed; within rim. Hilum rim color of or darker than testa (to blackish). Lens discernible (obscure) or not discernible; less than 0.5 mm or equal to or greater than 0.5 mm in length; 0.5–1 mm long; with margins straight; linear; not in groove of raphe; adjacent to hilum; 0.7 mm from hilum; flush; same or dissimilar color from testa; darker than testa; brown (reddish); not within corona, halo, or rim. Endosperm thin; covering entire embryo; adnate to testa. Cotyledons smooth; both outer faces convex; both the same thickness; both more or less of equal length; not folded; margin entire 180 degrees from base of radicle; similar at apex; partially concealing radicle; notched at radicle; with lobes; with lobes not touching; without basal groin formed by lobes; with the interface division terminating at base of radicle; with 1 or both margins recessed; yellow; inner face flat; glabrous around base of radicle. Embryonic axis deflexed; oblique to length of seed; without a joint evident between the radicle and the cotyledons. Radicle bulbous; lobe tip straight; deflexed and parallel to cotyledon length; centered between cotyledons; less than 1/2 length of cotyledons. Plumule rudimentary; glabrous.

Distribution: Southwestern United States and northern Mexico.

Notes: Porter (1956) and Lavin and Sousa (1995) monographed the genus.

Peteria: *P. thompsoniae* S. Watson (C–E), *P. spp.* (A–B). A, Fruit with calyx ($\times 1.7$); B, seeds ($\times 4.8$); C–D, testa ($\times 50$, $\times 1000$); E, embryos ($\times 6$).

O



Genus: *Genistidium* I.M. Johnston

Phylogenetic Number: 8.11.

Tribe: Robinieae.

Group: Robinia.

Species Studied—Species in Genus: 1 sp.—1 sp.

Fruit a legume; unilocular; $1.5\text{--}3.5 \times 0.4\text{--}0.7 \times 0.25\text{--}0.27$ cm; with persistent androecial sheath; with deciduous corolla; with persistent calyx; with calyx shorter than fruit; without orifice formed by curving of fruit or fruit segments; straight; not plicate; not twisted; symmetrical or asymmetrical; linear (broadly); with both sutures nearly straight; not inflated; compressed; without beak; short tapered at apex; apex aligned with longitudinal axis of fruit; short tapered at base; base aligned or oblique with longitudinal axis of fruit (slightly); with the apex and base uniform in texture; coriaceous; seed chambers externally visible; with the raised seed chambers not torulose. Fruit margin not constricted; without sulcus; plain. Fruit wings absent. Fruit nonstipitate. Fruit with all layers dehiscing; splitting along sutures. Dehiscence of valves along both sutures; apical and down; passive. Replum invisible. Epicarp dull; monochrome; tan; pubescent and indurate; with hairs appressed; with 1 type of pubescence; with pubescence gray; with pubescence uniformly distributed; with simple hairs; pliable; with hair bases plain; eglandular; without spines; not smooth; with elevated features; not veined; not tuberculate; wrinkled; not exfoliating; without cracks. Mesocarp thin; surface not veined; 1-layered; without balsamic vesicles; without fibers; solid; coriaceous. Endocarp dull; monochrome; tan; smooth; nonseptate; chartaceous; not exfoliating; remaining fused to epicarp; entire. Seeds 1–3; length parallel with fruit length; neither overlapping nor touching; in 1 series. Funiculus less than 0.5 mm long; of 1 length only; flattened; straight. Aril dry. Aril tongue-aril. Aril tan.

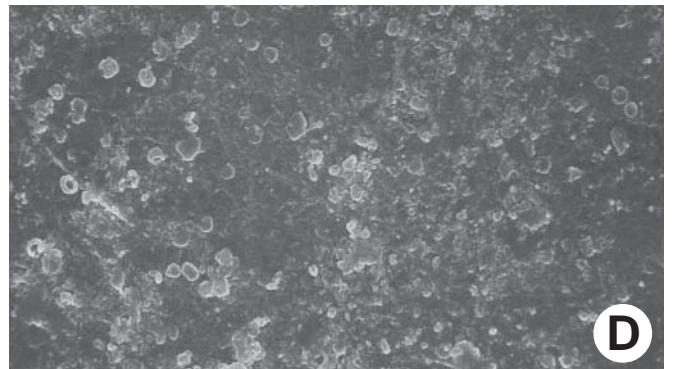
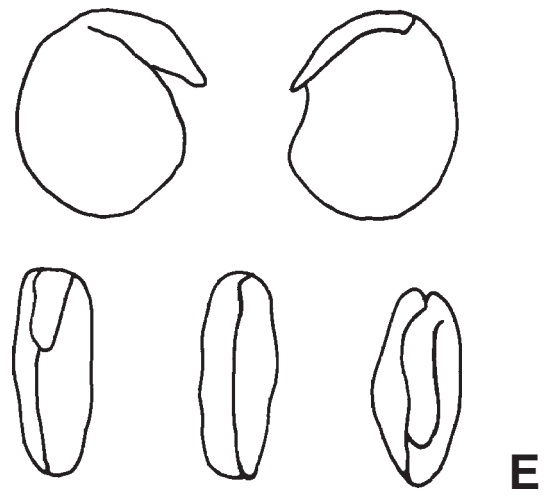
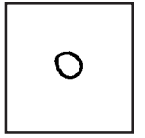
Seed $4.2 \times 3.5 \times 2$ mm; not overgrown; not angular; symmetrical; circular (sub) or oblong; compressed; with surface smooth; without visible radicle and cotyledon lobes; without hilar sinus; without umbo on seed faces. Testa not adhering to endocarp; glossy; not modified by a bloom; colored; mottled and streaked; with frequent mottles; with frequent streaks; brown (reddish); with black overlay; glabrous; smooth; coriaceous. Fracture lines absent. Rim absent. Wings absent. Raphe not

visible. Hilum partially concealed; concealed by aril; with faboid split; with the lips of the faboid split the same color as the rest of the hilum; punctiform; marginal according to radicle tip; recessed; not within corona, halo, or rim. Lens discernible; equal to or greater than 0.5 mm in length; 2 mm long; with margins straight; linear (with circular center); not in groove of raphe; adjacent to hilum; 0.5 mm from hilum; mounded; similar color as testa; darker than testa; brown (reddish); not within corona, halo, or rim. Endosperm thin; covering entire embryo; adnate to testa. Cotyledons smooth; both outer faces convex; both the same thickness; both more or less of equal length; not folded; margin entire 180 degrees from base of radicle; similar at apex; partially concealing radicle; notched at radicle; with lobes; with lobes not touching; without basal groin formed by lobes; with the interface division terminating at base of radicle; without margins recessed; brown (reddish); inner face flat; glabrous around base of radicle. Embryonic axis deflexed; oblique to length of seed; without a joint evident between the radicle and the cotyledons. Radicle linear; lobe tip straight; deflexed and parallel to cotyledon length; centered between cotyledons; less than 1/2 length of cotyledons. Plumule rudimentary; glabrous.

Distribution: United States (Texas: Brewster County) and Mexico (Coahuila and southern Nuevo León).

Notes: Lavin and Sousa (1995) monographed *Genistidium*. Only a limited number of seeds and fruits were available for study.

Genistidium: *G. dumosum* I.M. Johnson (A–E). A, Fruit and valve ($\times 2.9$); B, seed ($\times 11.7$); C–D, testa ($\times 50$, $\times 1000$); E, embryos ($\times 6.8$).



Genus: *Sphinctospermum* J.N. Rose

Phylogenetic Number: 8.12.

Tribe: Robinieae.

Group: Robinia.

Species Studied—Species in Genus: 1 sp.—1 sp.

Fruit a legume; unilocular; $1.5\text{--}3.5 \times 0.25\text{--}0.35 \times 1\text{--}1.5$ cm; with persistent or deciduous calyx; with calyx shorter than fruit; without orifice formed by curving of fruit or fruit segments; straight; not plicate; not twisted; symmetrical; linear; not inflated; flattened; with beak (very short); straight or declined; with solid beak the same color and texture as fruit; short tapered at apex; apex aligned with longitudinal axis of fruit; tapered at base; base aligned with longitudinal axis of fruit; with the apex and base uniform in texture; chartaceous; seed chambers externally invisible. Fruit margin not constricted; without sulcus; embellished; with thickened sutural areas. Fruit wings absent. Fruit nonstipitate. Fruit with all layers dehiscing; splitting along sutures. Dehiscence of valves along both sutures; apical and down; active; with valves twisting. Replum invisible. Epicarp dull; monochrome or multicolored; mottled; tan; with brown overlay; with mottling over seed chambers; with surface texture uniform; glabrous; eglandular; without spines; not smooth; with elevated features; not veined; not tuberculate; striate; not exfoliating; without cracks. Mesocarp trace; surface not veined; 1-layered; without balsamic vesicles; without fibers; solid; chartaceous. Endocarp dull; translucent; monochrome or mottled; tan; with mottling; with brown overlay; smooth; without adhering pieces of testa; septate; with septa thin (like tissue paper), flexible; with septa eglandular; chartaceous; not exfoliating; remaining fused to mesocarp and epicarp; entire. Seeds 3–12; length parallel with fruit length; neither overlapping nor touching; in 1 series. Funiculus measured; ca. 0.5 mm long; of 1 length only; filiform; straight. Aril dry; minute rim-aril; cream.

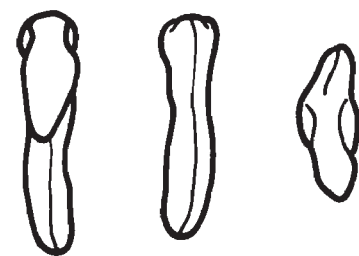
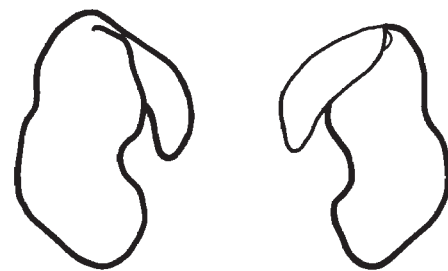
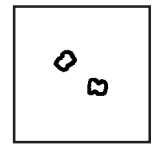
Seed $2\text{--}3 \times \text{ca. } 2 \times \text{ca. } 1.5$ mm; not overgrown; angular; symmetrical; rectangular (with central constriction); compressed (diamond-shaped); with surface grooved; with grooves transverse; without visible radicle and cotyledon lobes; without hilar sinus; without umbo on seed faces; without medial ridge on each face. Cuticle not exfoliating; not inflated; not wrinkled. Testa without pieces of adhering epicarp; not adhering to

endocarp; free from endocarp; dull; not modified by a bloom; colored; monochrome; tan to brown; glabrous; not smooth; with elevated features; papillate; chartaceous. Fracture lines absent. Rim absent. Wings absent. Raphe not visible. Hilum fully concealed; concealed by aril; punctiform (elliptic); apical according to radicle tip but marginal according to seed length; recessed; not within corona, halo, or rim. Lens not discernible. Endosperm thick; not pluglike and not resembling tip of radicle; covering entire embryo; adnate to testa. Cotyledons smooth; both outer faces flat; both the same thickness; both more or less of equal length; not folded; margin entire 180 degrees from base of radicle; similar at apex; not concealing radicle; notched at radicle; without lobes; with the interface division terminating at base of radicle; without margins recessed; white to yellow; inner face flat; glabrous around base of radicle. Embryonic axis oblique to right angled; oblique or perpendicular to length of seed; without a joint evident between the radicle and the cotyledons. Radicle differentiated from cotyledon; bulbous; lobe tip curved; oblique to cotyledons to with 90-degree turn; centered between cotyledons; 1/2 to nearly length of cotyledons. Plumule rudimentary; glabrous.

Distribution: Southwestern United States and northwestern Mexico.

Notes: Lavin (1987) transferred *Sphinctospermum* to Millettieae. Lavin and Doyle (1991) and Polhill (1994b), integrating morphological and chloroplast DNA data and analyzing it cladistically, concluded that *Sphinctospermum* should be returned to Robinieae. Lavin and Sousa (1995) monographed the genus. The strong constriction around the middle of the seeds is unique in legumes. The distinctive seeds have been referred to as hourglass shaped (Kearney and Peebles 1951).

Sphinctospermum: *S. constrictum* (S. Watson) J.N. Rose (A–E). A, Fruits ($\times 3$); B, seeds ($\times 7$); C–D, testa ($\times 50$, $\times 1000$); E, embryos ($\times 10$).



E

